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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,423	03/02/2004	Mark O. Scates	10437.0081.NPUS01	2422

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EXAMINER

PUTTLITZ, KARL J

ART UNIT	PAPER NUMBER
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1621

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/708,423	SCATES ET AL.	
	Examiner	Art Unit	
	Karl J. Puttlitz	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) 1-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7/15/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The page numbers of the specification are missing. Appropriate correction is required.

Applicant is required to update the status of copending applications 10/708,420 and 10/708,421, mentioned at paragraph 0025 of the specification, as appropriate.

Drawings

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the lines in the figure are not solid. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

Claims 1-14 are objected to because of the following informalities: The annotations in brackets ("[]") before the claims should be removed. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 and 6-9 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for adding dimethyl ether to a reaction product, a volatile phase, the first overhead stream, or a stream associated with the distillation step, does not reasonably provide enablement for adding dimethyl ether at any step in the process, including the reaction step, in order to enhance separation of the first overhead to form the first and second liquid phases. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

"The standard for determining whether the specification meets the enablement requirement [in accordance with the statute] was cast in the Supreme Court decision of *Mineral Separation v. Hyde*, 242 U.S. 261, 270 (1916) which postured the question: is the experimentation needed to practice the invention undue or unreasonable? That standard is still the one to be applied. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). Accordingly, even though the statute does not use the term "undue experimentation," it has been interpreted to require that the claimed invention be enabled so that any person skilled in the art can make and use the invention without undue experimentation. *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir.

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1988). See also *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988). See M.P.E.P. § 2164.

In the instant case, the claims cover adding dimethyl ether anywhere in the process effective to enhance separation of the first overhead to form the first and second liquid phases, see claim 1. Based on the above standards, the disclosure must contain sufficient information to enable one skilled in the pertinent art to use this invention without undue experimentation. See M.P.E.P. 2164.01. Given the scope of the claims, it does not.

The specification indicates that dimethyl ether (DME) may be added anywhere in the process provided that a sufficient quantity of DME accumulates in the light ends decanter, see paragraph 0027. However, the specification also teaches that by adding DME only to the light ends overhead, the light ends column feed, or another stream associated with the light ends column, only then will the liquid contents of decanter can be prevented from forming a single phase and the first and second phases can form, see paragraph 0025. In this regard, the specification fails to teach how adding DME at any point in the process will provide sufficient accumulation in the decanter to effect separation of the first overhead. Indeed, for example, those of ordinary skill would expect that adding more DME to the reaction mixture would not provide the requisite amounts in the decanter since DME in the reaction mixture would be converted to acetic acid or other by-products. Therefore, adding DME to the reaction mixture, which is included in the current scope of the claims, would not logically provide the expected amounts phase separation, and thus require undue experimentation.

The examiner understands that there is no requirement that the specification disclose every possible embodiment if there is sufficient guidance given by knowledge in the art (See M.P.E.P. § 2164.05(a) "[t]he specification need not disclose what is well-known to those skilled in the art and preferably omits that which is well-known to those skilled and already available to the public. *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987); and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984).").

However, the instant case goes beyond what is known in the art, because the specification does not offer any guidance on how one of ordinary skill would go about practicing the invention for effective separation when DME is added to any place in the process, such as the reaction mixture.

Applicant is reminded of the heightened enablement for chemical inventions. Specifically, the amount of guidance or direction needed to enable the invention is inversely related to the amount of knowledge in the state of the art as well as the predictability in the art. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970). The "amount of guidance or direction" refers to that information in the application, as originally filed, that teaches exactly how to make or use the invention. The more that is known in the prior art about the nature of the invention, how to make, and how to use the invention, and the more predictable the art is, the less information needs to be explicitly stated in the specification. In contrast, if little is known in the prior art about the

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nature of the invention and the art is unpredictable, the specification would need more detail as to how to make and use the invention in order to be enabling. [I]n the field of chemistry generally, there may be times when the well-known unpredictability of chemical reactions will alone be enough to create a reasonable doubt as to the accuracy of a particular broad statement put forward as enabling support for a claim. This will especially be the case where the statement is, on its face, contrary to generally accepted scientific principles. Most often, additional factors, such as the teachings in pertinent references, will be available to substantiate any doubts that the asserted scope of objective enablement is in fact commensurate with the scope of protection sought and to support any demands based thereon for proof. [Footnote omitted.]

Here, the requirement for enablement is not met since the claims go far beyond the enabling disclosure. Thus, based on the forgoing, claims 1 and 6-9 are *prima facie* non-enabled for their full scope.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites distilling a volatile phase to produce a first overhead comprising water, methyl acetate, and methyl iodide. However, the claims later states phase separating the first overhead to provide a first liquid phase comprising water and a

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second liquid phase comprising methyl iodide. The claims fail to state how the methyl acetate was processed, and is thus indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 11, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,371,286 to Blay et al. (Blay) in view of JP 09235250 (JP250).

The rejected claims are drawn to a process for producing acetic acid, comprising the steps of: (a) reacting carbon monoxide with at least one reactant selected from the group consisting of methanol, methyl acetate, methyl formate, dimethyl ether and mixtures thereof in a reaction medium comprising water, methyl iodide, and a catalyst to produce a reaction product comprising acetic acid; (b) performing a vapor-liquid separation on said reaction product to provide a volatile phase comprising acetic acid, water, and methyl iodide and a less volatile phase comprising said catalyst; (c) distilling said volatile phase to produce a purified acetic acid product and a first overhead comprising water, methyl acetate, and methyl iodide; (d) phase separating said first overhead to provide a first liquid phase comprising water and a second liquid phase

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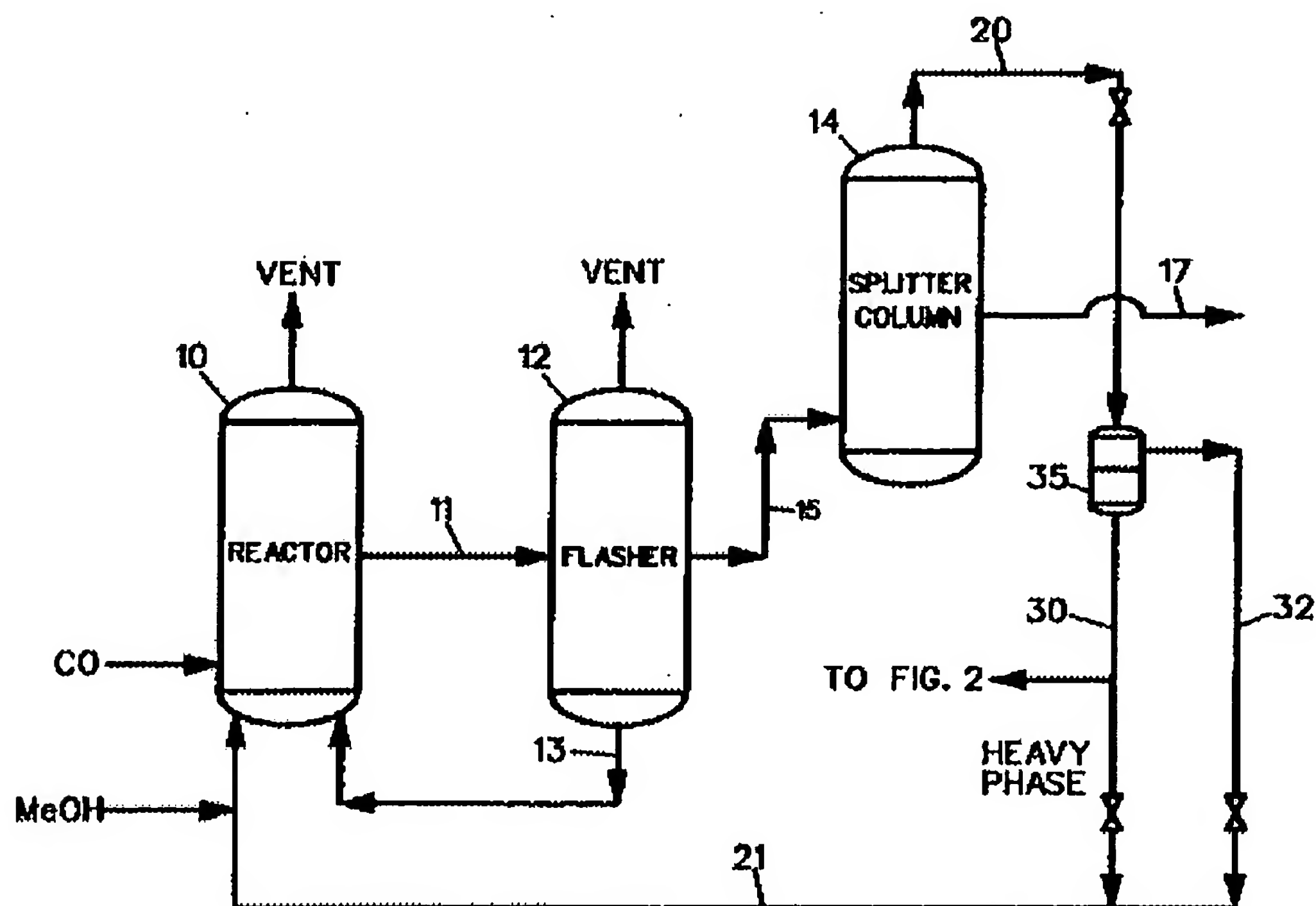
comprising methyl iodide; and (e) adding dimethyl ether to the process in an amount effective to enhance separation of the first overhead to form the first and second liquid phases.

The rejected claims are also cover those embodiments wherein the dimethyl ether is added to at least one of said reaction product, said volatile phase, said first overhead, or a stream or column associated with said distillation.

The rejected claims also cover a method for phase separating a mixture comprising acetic acid, methyl acetate, methyl iodide, and water to provide a first liquid phase comprising water and methyl acetate and a second liquid phase comprising methyl iodide, the improvement comprising adding dimethyl ether to the mixture to facilitate the separation.

The rejected claims also cover a method for separating a mixture comprising acetic acid, methyl iodide, and water to provide a purified acetic acid product, a first liquid phase comprising water, and a second liquid phase comprising methyl iodide, comprising the steps of: distilling the mixture to provide an overhead fraction and said purified acetic acid product; phase separating the overhead fraction to provide said first and second liquid phases; refluxing a portion of the first liquid phase in the distillation; and adding dimethyl ether to the mixture, to the overhead fraction or to the refluxed portion of the first liquid phase in an amount effective to enhance phase separation of the first and second liquid phases. Specifically, the mixture is provided as a volatile phase of a reaction product of a carbonylation reactor.

With regard to the above embodiments, Blay teaches a process with regard to the following figure:



Wherein liquid product is drawn off from carbonylation reactor 10 at a rate sufficient to maintain a constant level therein and is introduced to flasher 12 via line 11. In flasher 12 the catalyst solution is withdrawn as a base stream 13 (predominantly acetic acid containing the rhodium and the iodide salt along with lesser quantities of methyl acetate, methyl iodide, and water), while the overhead 15 of the flasher comprises largely the product acetic acid along with methyl iodide, methyl acetate, and water. Dissolved gases in stream 11 consisting of a portion of the carbon monoxide

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along with gaseous by-products such as methane, hydrogen, and carbon dioxide exits the top of the splitter column overhead receiver.

The product acetic acid drawn from the side of methyl iodide-acetic acid splitter column 14 near the base (it can also be withdrawn as a base stream) is directed via line 17 for final purification such as to remove water as desired by methods which are obvious to those skilled in the art including, most preferably, distillation. The overhead 20 from methyl iodide-acetic acid splitter, comprising mainly methyl iodide and methyl acetate plus some water and acetic acid, is recycled via line 21 to the carbonylation reactor 10. When overhead 20 is condensed it typically splits into two liquid phases in decanter 35 if sufficient water is present. The heavy phase 30 is comprised mainly of methyl iodide plus some methyl acetate and acetic acid as well as the alkane and carbonyl impurities. The light phase 32 is comprised mainly of water and acetic acid plus some methyl acetate. The overhead heavy phase 30 from methyl iodide-acetic acid splitter is subject to treatment according to this invention or these streams can be combined with recycle products from further purification processes containing methyl iodide, methyl acetate, water, and other impurities to become recycle 21 which may also be subject to treatment according to this invention. See description bridging columns 5 and 6.

The difference between the rejected claims and the process disclosed by Blay is that Blay fails to teach adding dimethyl ether to the process in an amount effective to enhance separation of a first overhead to form a first and second liquid phases. It is for this proposition, however, that the examiner joins JP 250.

JP 250 teaches a carbonylation reaction to produce acetic acid from methanol and dimethyl ether. The patent teaches that a product gas was mixed with MeOH and Me₂O. Those of ordinary skill would have been motivated to modify Blay to include a step of adding dimethyl ether since JP 250 teaches that this process is effective for processing the catalyst (see CAPLUS online abstract [retrieved 13 June 2006] Chemical Abstracts, Columbus, OH, USA). Those of ordinary skill would expect that the added dimethyl ether would have the same separation effect on a first overhead, as disclosed in Blay. Although JP 250 adds dimethyl ether for a different reason as Applicant, the instant rejection need not reflect the motivation set forth in the specification, see M.P.E.P. 2144 ("The reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. *In re Linter*, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972)").

Therefore, the rejected claims are prima facie obvious in view of the combination of Blay and JP 250 since these references teach or suggest the elements of these claims with a reasonable expectation of success.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory

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obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6 and 11-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 12, 13 and 27-29 of copending Application No. 10/708420 (copending application). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Specifically, the difference between the rejected claims and claims of the copending application is that the claims of the copending application are drawn to removal of permanganate reducing compounds (PRC's) from a carbonylation reaction. However, the claims of the copending application require addition of dimethyl ether in such a manner that teach the rejected claims with such particularity and guidance that the rejected claims would have been *prima facie* obvious within the meaning of section 103, since the claims of the copending application also recite addition of dimethyl ether or removal of acetaldehyde (a PRC) by addition of dimethyl ether.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1-6 and 11-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4-6, 16, 26 and 34 of copending Application No. 10/708,421 (copending application). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Specifically, the difference between the rejected claims and claims of the copending application is that the claims of the copending application are drawn to removal of permanganate reducing compounds (PRC's) from a carbonylation reaction. However, the claims of the copending application require addition of dimethyl ether in such a manner that teach the rejected claims with such particularity and guidance that the rejected claims would have been *prima facie* obvious within the meaning of section 103, since the claims of the copending application also recite addition of dimethyl ether or removal of acetaldehyde (a PRC) by addition of dimethyl ether.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1 and 4-6 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 4 of copending Application No. 11/116471. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Specifically, the difference between the rejected claims and claims of the copending application is that the claims of the copending application are drawn to

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removal of permanganate reducing compounds (PRC's) from a carbonylation reaction. However, the claims of the copending application require addition of dimethyl ether in such a manner that teach the rejected claims with such particularity and guidance that the rejected claims would have been *prima facie* obvious within the meaning of section 103, since the claims of the copending application also recite addition of dimethyl ether or removal of acetaldehyde (a PRC) by addition of dimethyl ether.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page, can be reached at telephone number (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karl J. Puttlitz
Assistant Examiner